PATENT

Appl. No. 09/845,036
Amdt. dated July 8, 2003
Reply to Office Action of June 17, 2003

REMARKS/ARGUMENTS

Claims 21-75 are pending in the present application. Claims 21-31 and 33-75 are under examination, and claim 32 has been withdrawn pursuant to a restriction requirement. Applicants respectfully maintain their traverse of the restriction requirement. Independent claim 20 is generic to administering an antigen, either directly, or indirectly via nucleic acid encoding an antigen. Thus, claim 32 is a species of claim 20.

The instantly pending claims are now further subject to the following species election regarding an antigen.

I) toxin B
II) toxin A
III) a protein from a *C. difficile* (VPI10463) cell
IV) *C. difficile* spore

Applicants elect species group III, a protein from a *C. difficile* (VPI10463) cell, with traverse.

According to the Office Action, claims 21-31, 33-37, and 43-75 are generic. It is respectfully submitted that claim 38, which recites an antigen "derived from a culture of *Clostridium difficile*" should also be included as a generic claim, as it encompasses each of the above-recited species.

The Examiner has reclassified Restriction Group I from class 435, subclass 70.1 (use of tissue cell culture to make a protein or polypeptide) to class 424, subclass 184.1 (drug, bio-affecting and body treating compositions: antigen, epitope, or other immunospecific immunoeffector). To expand examination of the antigen beyond protein antigens, the Examiner has asked for evidence that the present application contemplates antigens other than proteins. Applicants n te that paragraph 14 of the present application teaches that "[a]ntigens to which said antigen-specific antibody is raised can be *any compound* or collection of compounds

capable of eliciting an immune response." (Emphasis added). This is consistent with the description of antigens provided by Alberts et al. in Molecular Biology of the Cell 3rd Ed., (1994) p. 1195 (copy enclosed). Thus, although certain examples recited in the present specification may describe the use of protein antigens, it is respectfully submitted that it is within the scope of the presently claimed invention to use non-protein antigens.

Based on the above, Applicants respectfully submit that the claim 38 is properly a generic claim, and further, that Restriction Group I should not be limited to protein antigens, but should include all antigens regardless of composition.

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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

Nathan S. Cassell
Reg. No. 42,396

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, 8th Floor
San Francisco, California 94111-3834
Tel: 650-326-2400
Fax: 415-576-0300
NSC:nsc
PA 3316261 v1

The Immune System

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- The Cellular Basis of Immunity
- The Functional Properties of Antibodies
- The Fine Structure of Antibodies
- The Generation of Antibody Diversity
- T Cell Receptors and Subclasses
- MHC Molecules and Antigen Presentation to T Cells
- Helper T Cells and B Cell Activation
- Selection of the T Cell Repertoire

Our immune system saves us from certain death by infection. Any vertebrate born with a severely defective immune system will soon die unless extraordinary measures are taken to isolate it from a host of infectious agents—bacterial, viral, fungal, and parasitic. Whereas all vertebrates have an immune system, invertebrates have more primitive defense systems, which often rely chiefly on phagocytic cells. Such cells (mainly macrophages and neutrophils) also play an important role in defending vertebrates against infection, but they are only one part of a much more complex and sophisticated defense strategy.

Immunology, the study of the immune system, grew out of the common observation that people who recover from certain infections are thereafter "immune" to the disease; that is, they rarely develop the same disease again. Immunity is highly specific: an individual who recovers from measles is protected against the measles virus but not against other common viruses, such as mumps or chicken pox. Such specificity is a fundamental characteristic of immune responses.

Many of the responses of the immune system initiate the destruction and elimination of invading organisms and any toxic molecules produced by them. Because these immune reactions are destructive, it is essential that they be made only in response to molecules that are foreign to the host and not to those of the host itself. This ability to distinguish *foreign* molecules from *self* molecules is another fundamental feature of the immune system. Occasionally, it fails to make this distinction and reacts destructively against the host's own molecules; such *autoimmune diseases* can be fatal.

Although the immune system evolved to protect vertebrates from infection by microorganisms and larger parasites, most of what we know about immunity has come from studies of the responses of laboratory animals to injections of noninfectious substances, such as foreign proteins and polysaccharides. Almost any macromolecule, as long as it is foreign to the recipient, can induce an immune response; any substance capable of eliciting an immune response is referred to as an **antigen** (*anti*body *gen*erator). Remarkably, the immune system can distinguish between antigens that are very similar—such as between two proteins that differ in only a single amino acid or between two optical isomers of the same molecule.

There are two broad classes of immune responses: (1) antibody responses and (2) cell-mediated immune responses. **Antibody responses** involve the production of antibodies, which are proteins called *immunoglobulins*. The antibod-